

An enquiry into potential graduate entrepreneurship: is higher education turning off the pipeline of graduate entrepreneurs?

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Structured Abstract

In today's global economy, high in talent but low in growth, the capability and skills mismatch between the output of universities and the demands of business has escalated to a worrying extent for graduates. Increasingly, university students are considering alternatives to a lifetime of employment, including their own start-up, and becoming an entrepreneur. The literature indicates a significant disconnect between the role and value of education and healthy enterprising economies, with many less-educated economies growing faster than more knowledgeable ones. Moreover, theory concerning the entrepreneurial pipeline and entrepreneurial ecosystems is applied to graduate entrepreneurial intentions and aspirations.

Using on a large-scale online quantitative survey, this study explores graduate 'entrepreneurial intention' in the UK and France, taking into consideration personal, social and situational factors. The results point to a number of factors that contribute to entrepreneurial intention including social background, parental occupation, gender, subject of study, and nationality. The study furthers the understanding of and contributes to the extant literature on graduate entrepreneurship. It provides an original insight into a topical and contemporary issue, raising a number of research questions for future study.

For too long, students have been educated to be employees, not entrepreneurs. The study points strongly to the fact that today's students have both willingness and intention to become entrepreneurs. However, the range of pedagogical and curriculum content does not correspond with the ambition of those who wish to develop entrepreneurial skills. There is an urgent need for directors of higher education and pedagogues to rethink their education offer in order to create a generation of entrepreneurs for tomorrow's business world. The challenge will be to integrate two key considerations: how to create a business idea and how to make it happen practically and theoretically. Clearly, change in the education product will necessitate change in the HE business model.

The data set collected was extensive (c3500), with a focus on France and the UK. More business, engineering and technology students completed the survey than others. Further research is being undertaken to look at other countries (and continents) to test the value of extrapolation of findings. Initial results parallel those described in this paper.

Some things can be taught, others need nurturing. Entrepreneurship involves a complex set of processes which engender individual development, and are highly personalised. Higher Education Enterprise and Teaching and Learning Strategies need to be cognisant of this, and to develop innovative and appropriate curricula, including assessment, which reflects the importance of the process as much as that of the destination.

The global economy, propelled by the push and pull of technology, is changing at a speed never before seen. This is having profound political, social and economic effects which necessitate fundamental change that we organise ourselves and our activities. Current models and modus operandi are proving increasingly unfit for purpose. Nurturing and encouraging agile mindsets, creativity, supporting the testing of new ideas and ways of doing things and adapting / adopting to

innovation are all critical future employability factors. Our future prosperity and well being will be dependent on creating new learning models.

This work builds on an extensive literature review coupled with original primary research. The authors originate from a variety of backgrounds and disciplines, and the result is a very challenging set of thoughts, comments and suggestions that are relevant to all higher education institutions, at policy, strategy and operational levels.

Introduction

Whilst education and specifically higher education can be shown to provide the knowledge, skills and capacity in contributing to society and the economy, it is increasingly difficult to proclaim with any certitude whether more graduates will mean greater economic return. According to the Global Entrepreneurship Monitor (<http://www.gemconsortium.org/>), arguably the world's largest entrepreneurship research group, declining employment opportunities and automation of previously human-operated processes is creating a chasm between highly educated individuals and employment opportunities. Although there is indisputable evidence that education contributes to higher returns for individuals in employment, not all graduates and school-leavers will be able to find work. Recruitment is complicated by a number of factors including geographic location and demographics of the global talent pool. Undoubtedly, there are too many similarly qualified graduates chasing too few jobs. The authors propose an alternative however: successful enterprise and business start-up, as Geldhof *et al* (2014, cited in Schøtt, Kew and Cheraghi (2015) argue: "A justification for investing in education and training is that many young people intend to become entrepreneurs, but few of them go on to start an enterprise, presumably because of insufficient training". It is glaringly insufficient for institutions of higher education (HEIs) to create a knowledge economy; what is needed is a new knowledge economy that can produce more individuals who will become entrepreneurs – more role models resembling Steve Jobs, Bill Gates and Mark Zuckerberg – all of whom began their highly successful businesses whilst at university. In some regions of the world, the lack of education is not preventing or inhibiting young enterprise (ILO, 2013); the paradox whereby people with more opportunity are often less opportunistic is a fundamental concern for EU policy makers and national governments.

Schumpeter (1942) argued that in times of revolutionary change, innovation becomes a key factor in the quest to survive and thrive. In addition to the long-established economic trinity of

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land, labour and capital, he added what he considered to be the critical fourth factor of production – entrepreneurship. His argument was that some opportunistic, creative individuals, whom he labelled entrepreneurs, have the gift of identifying a way of doing things differently, using and adapting contemporary technologies and processes, but also possessing a mind-set whereby they are prepared to assume heightened risk that accompanies significant change. His concept of ‘creative destruction’ describes the process whereby entrepreneurs become change agents, using new approaches to challenge the *status quo* and to deliver goods and services more economically, efficiently and effectively, based around additional benefits created and the consequential demand for them. In other words, new industries, businesses and jobs cannot be created without destroying elements of the existing order (Cox and Alm, 1992). Schumpeter’s economic discourse resonates in the global economy that characterises the latter half of the decade known as the ‘twenty-tens’. Extending his argument, if it is the case that entrepreneurs, adapting and adopting innovative approaches are driving political, economic and social change, then how do we find, encourage and nurture them?

Arguably, the real challenge today relates to the accelerated speed of change propelled by global, instantaneous and pervasive information and communications technologies (ICT) which economies have integrated, and the consequent challenge to discover advanced business models that can more readily adapt to dynamic change in ICT. In the 21st century, Schumpeter’s ideas of innovation and the role of the entrepreneur have never been stronger, but the innovators of tomorrow are likely to originate from the pupils and students in today’s education system. At the time of writing, the alternatives are uncertain. It is nevertheless implausible to take no action and hope something materialises.

Governments across the world are struggling with developing their human capital through investment and policy to support a knowledge economy, which itself must be more than mere knowledge creation. Successful nations will be knowledge ‘*appliers*’ – entrepreneurs. In the UK, this process includes a reformulation of education at primary and secondary levels, with initiatives that encourage even the youngest children to ‘take a risk’, ‘have a go’, enjoy the fun of enterprise and start their own business. These young people are now considering their next steps: university education and the prospect of employment, or launch into business start-up? If the latter option is chosen, it begs the question of the purpose of attending university since the traditional cursus is inappropriate for a self-driven learner.

Context: the knowledge economy and enterprise

The phrase 'knowledge-based economy' is frequently used by politicians and the media to describe twenty-first century wealth creation processes, often accompanied by buzz words and jargon such as 'high value-added' and 'sustainable business model'. In popular discourse, the term 'global knowledge economy' "is used in a casual manner to refer to the knowledge economy beyond the boundaries of one nation. It is a term produced from the convergence of the knowledge economy and the global economy" (Roberts, 2009: 286). Although there is no universal definition of the term, the Economic and Social Research Council (2007) refer to the application of knowledge, rather than the existence of it, to describe how economic success is increasingly based on the effective utilisation of intangible assets such as knowledge, skills and innovative potential as the key resource for competitive advantage. The term 'knowledge economy' thus describes this emerging economic structure.

Throughout history, human beings and society have applied differential knowledge to the exploration and development of commercial opportunities and civilizations. OECD notes that "Knowledge, as embodied in human beings (as "human capital") and in technology, has always been central to economic development" (OECD, 1996: 9). Whilst the term 'knowledge economy' often projects a technological perspective related to information technology, information systems and networks, it has become decreasingly associated with scientific and technical knowledge, and more consciously with the human capital and systems that are central to knowledge creation, dissemination and application.

Powell and Snellmen (2004) note the implications of knowledge-intensive economies to many aspects of organisational form, employee engagement and involvement, and product development. The overarching idea in the literature is that innovative practices within the firm require less structured management, more creativity and more risk-taking. They advocate "that governments encourage the reorganization of work, because 'firms that introduce new practices such as employee involvement, flatter management structures and team work tend to enjoy higher productivity gains than other firms'" (OECD 2000, in Powell and Snellmen (2004:210)

This detail implies a certain vision: that we should aspire to undertake activity which provides high marginal gain and that the innovative application of knowledge will be a primary means to create sustainable competitive advantage in a mobile and global world. The role of national education systems is then twofold: To provide young people with the knowledge and skills to support the existing infrastructure (current employers and current businesses); and, to develop the skills and knowledge required for new business creation – on other words, an enterprise

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pipeline. In fact, for over two thousand years, societies have been successfully exploiting knowledge to their own advantage, and economies have evolved around this knowledge.

Entrepreneurship, employment and education

The basis of economic power and global influence has never been so uncertain, as rapidly developing countries (Brazil, India and China) overtake former global powers, and as competition for resources becomes a global challenge. At the same time, the US Dept of Agriculture (2015) predicts that many European and mature states, including Japan, will gradually decline through lack of innovation and growth. At Bloomberg, Smialek (2015) warns “Get ready for a new economic order. In the world 15 years from now, the U.S. will be far less dominant, several emerging markets will catapult into prominence, and some of the largest European economies will be slipping behind”. Even the EU *per se* accepts that without significant investment and specifically innovation, it will start to fall behind others as a global region. The *Europe 2020* strategy identifies education and social capital as central themes in the sustainability of growth throughout Europe, quoting José Manuel Barroso, President of the European Commission: “Europe 2020 is the EU's growth strategy for the coming decade. In a changing world, we want the EU to become a smart, sustainable and inclusive economy. These three mutually reinforcing priorities should help the EU and the Member States deliver high levels of employment, productivity and social cohesion. Concretely, the Union has set five ambitious objectives - on employment, innovation, education, social inclusion and climate/energy - to be reached by 2020” (European Commission, 2010).

For the EU and other mature markets, the balance of education, social inclusion, innovation and employment has become an impossible task, as globalisation has destabilised the labour market with more job-seeking graduates than jobs available, and a declining differential between markets. GEDI (2015) reports that this imbalance is universal and it will have global consequences for all those looking for opportunity, especially young adults. These economic challenges occur unevenly in different regions of the globe, “In the developed world, the population of the 15-59 age group, the core of the labor force, is expected to lose almost 15 percent between 2010 and 2040. However, the number of people in that age group in the developing world is still rising rapidly and is expected to increase by 50 percent by 2050, excluding China whose labor force has already stopped growing (GEDI, 2015:1). In sub-Saharan Africa alone, the population aged 15-59 will increase from the current 455m today to over one billion by 2050. Thus, most of the growth in the world’s labour force in the coming

decades will occur in the less developed countries (again excluding China), where the number of 15- to 59-year-olds will increase by 1.3 billion in the next 40 years. This estimation raises the question of how to satisfy the impending demand for jobs. It is reasonable to query the extent to which education can produce the route to a better job, or indeed if the role of education is in fact to support a change in direction.

For many years, the principal focus of higher education has been the provision of 'graduates for employment', with 'traditional' roles as scientists, engineers, accountants, business professionals and so on. This 'training for employment' role is now less significant as the global talent pool means highly skilled individuals are readily available from the world labour market, and the levels of skills amongst graduates educated in British and/or other Western HEIs is increasingly perceived by many as below expectations. The OECD report (2013) cites the UK as having one of the highest skills gaps in the developed world, with particularly large gaps between UK and world averages in literacy and problem solving. Exacerbating the gap is the perception that young people have a poor work ethic, or attitude, to work (CIPD, 2011; UKCES, 2012) which means that employers are looking elsewhere to recruit graduates including the traditionally excluded older population. The role 'training for employment' is still very important, but perhaps less important in a world that is being rapidly transformed by advances in ICT, with the result that many of the industries of the next decade are not yet known. Here, a parallel can be drawn with technology adoption and usage; the wider effects of ICT adoption and usage will not be seen until later. This is because ICT are subject to what is known as the 'rear-view mirror effect' (McLuhan, 1964); they cannot be identified until they have finished having an effect and are in the past. Take, for example, the social media revolution at the turn of the millennium. The onus is on educators to broaden the horizons of students and prepare them for ongoing disruption and uncertainty. Indeed, to encourage today's students to be the disrupters and innovators. Achieving this goal will necessitate a paradigm shift at meta, macro and micro levels of higher education. The learning path that students take today is more structured and supportive than before, but their progress into employment is now more precarious, competitive and limited, and increasingly the alternative path to innovation may be a realistic option.

Recent reviews of educational policy, practice and scholarly contributions (Sanghi *et al*, 2012; Potter and Watts, 2014; Wojdyło-Preisner and Zawadzki, 2015) clearly demonstrate the crucial role that a skilled and aspiring workforce can play on the economy and society. Education has consistently created and supported imagination, inspiration and innovation throughout history. The contribution that education is currently making has not diminished

but the balance and focus might be changing; evoking the profound analogy “Just as castles provided the source of strength for medieval towns, and factories provided prosperity in the industrial age, universities are the source of strength in the knowledge-based economy of the twenty-first century” (Dearing Review, 2002).

In June 2015, the Chair of the Royal Society of Edinburgh’s (RSE) Business Innovation Forum stated “A world-leading entrepreneurial nation will depend on a number of building blocks from strong support networks and an international outlook to innovative finance streams. But most of all it will depend on its ability to produce people with the ambition, vision, creativity, commitment and leadership capacity to drive venture creation and growth on a scale that will contribute to sustainable economic growth. Universities are in a uniquely powerful position to support Scotland’s young people to develop an entrepreneurial mind-set and the ability to realise their ambition” (RSE, 2015). A report commissioned by Direct Line (2015) put forward that “British undergraduate students could soon be following in the footsteps of Facebook founder Mark Zuckerberg, as many have already established their own business while still in university. A total of 52,000 British students now run their own enterprise. There appears to be a new generation of entrepreneurial undergraduates in our midst, with a further 15% planning to start their own business upon graduating”.

The daunting challenge for educators is to open the eyes of their students to the full range of opportunities and demands of the new knowledge economy, knowledge creation, knowledge dissemination and knowledge application – all of which require a shift in the purpose of education itself, from creating employees to creating employers. The growth in the enterprising student is not certain, with many statistics showing that the potential of young people is often thwarted. Reports and policy documents (e.g. Gillie, 2012; Lord Young, 2014) reveal evidence to show that primary and secondary schools in Britain are already developing mechanisms to teach entrepreneurship (such as The Fiver Challenge <http://www.fiverchallenge.org.uk>). At the time of writing, however, it is far from clear how the current education system can enable innovation and entrepreneurship whilst designed to deliver employees.

Youth and enterprise

The recent growth in enterprise amongst UK youth is significant and inspiring, reflecting the ability of students to develop entrepreneurial and employability skills (Kwong *et al.*, 2012). This evolution is a transformation, driven by a combination of macro-environmental and

individual responses to the existing economic conditions in which mature nations now operate. It draws attention to the issue of how higher education can add value to support this trend, and what could/should be done to promote a more positive move towards an educated entrepreneur nation.

The importance of entrepreneurial activity for the economic growth of countries is well established (Sánchez, 2010). Concerns have been voiced in a recent review by London School of Economics and Political Science (LSE) (2014) in which the findings of the 2014 Global Entrepreneurship and Development Index (GEDI) show that the UK has moved down from sixth to ninth place (LSE, 2014). “The researchers behind the GEDI study suggest that attitudes and entrepreneurial aspirations in the UK are holding back UK entrepreneurial performance and they further found that while UK entrepreneurial activity is innovative and enjoys strong cultural support, its full potential may be held back by negative attitudes and a lack of ambition, relative to leading entrepreneurial economies” (LSE, 2014). Paradoxically, the GEDI 2015 report ranks the UK amongst the top entrepreneurial nations in 4th place, outperforming other European states that are typically in decline. This metric raises the question of whether the transformation is being supported by the state infrastructure, such as education, or whether the growth in entrepreneurship and business start-up is driven by an individual’s expectations of taking responsibility and control of their own future.

Supporting the notion that children are our future, it is crucial to teach them well and to let them lead the way. Many countries including Britain are experiencing a rapid ageing of their populations – the result of demographic change: a combination of declining fertility and rising longevity. Kew *et al* (2015:9) and ILO (2013) note the impact of change; there is an increasingly apparent mismatch between the old systems and the new demands. The media refer to young adults as ‘the lost generation’. The ILO (2013) reports that “each year 121 million young people turn 16 years old, of which 89% will potentially be searching for work in developing regions. With 73 million young people already unemployed and an estimated 1.1 billion new potential workers expected between 2012 and 2020, youth unemployment is likely to become an even greater problem over time.”

The lack of opportunity for young adults is gaining critical dimensions, with increasing predictions of higher unemployment amongst the young, greater reliance on temporary and low skilled work for graduates, a growing expectation that employment will be ‘from within’, in other words, working for family and friends (ILO, 2013). Bearing this estimate in mind, it seems logical to foster a culture of entrepreneurship and young enterprise. Clearly, the evidence of the recent studies (RSE, 2015; Direct Line, 2015) suggest that this trend may

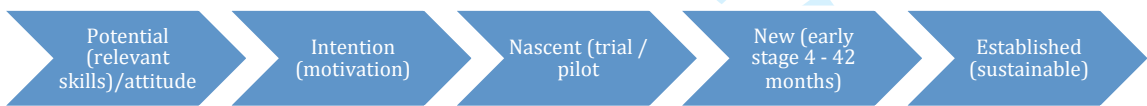
have already started, but it is not yet known if it can be sustained and whether there is a role for universities in this process.

Quoting multiple sources, Kew *et al* (2015:12) note that the perceptions of business start-ups are still facing opposition: “Fifty-nine percent of young people in the United Kingdom indicated that not having enough money is a key barrier that would prevent them from starting a business. Fear of failure (43%) and the current economic climate (42%) were additional barriers mentioned by these young people”. The evidence is blatant: the combination of reducing alternatives, a decreasing expectation that the state will provide, and the diversification of new business models (Internet-based and international) are driving a youth-led revolution that is already working in parallel with existing development systems. Increasingly, the young entrepreneur is now often also studying whilst being entrepreneurial.

Entrepreneurial ecosystems and the entrepreneur pipeline

The development of the entrepreneur can be considered a ‘*pipeline of entrepreneurship*’ (see Figure 1 (below): initially having the attitude to take a risk, or possessing the skills required to take advantage of opportunity, with the potential to create a business, through to running an established business.

Figure 1: The entrepreneurial pipeline

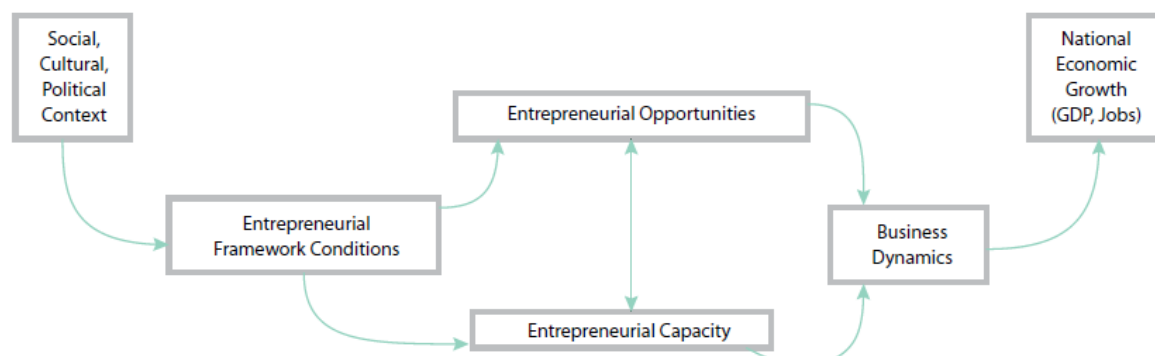


This five stage model has been researched annually within the GEM reports (full details available at www.gemconsortium.org). High levels of potential are in evidence even in low education economies, but the intention to start an enterprise quickly fades for all regions of the world to around 5% of the economy. Factors that appear to influence this pipeline include the availability of options to individuals, for instance UK/ European young adults are more likely to consider employment, rather than self-employment and typically don’t have an entrepreneurial mind-set (15% of population are potential entrepreneurs) whereas Sub-Saharan African youth have few choices for employment and poverty is the alternative (60%

potential entrepreneurs). Circumstance is only one aspect of influence in the choice to be entrepreneurial; research shows that levels of education can support a successful enterprise, and maturity (age) and confidence can also have a positive impact. Hence, countries with high confidence, high education levels and highly supportive innovation strategies tend to be more innovative and entrepreneurial – thus the USA is ranked number one.

Naturally, enterprise can only exist in an environment where the infrastructure for enterprise is adequately supported. This function is partly undertaken by national government and partly by local society. The GEDI group highlight the interaction between social and national frameworks that interact to power a pipeline of entrepreneurs. Similarly Reynolds, Hay and Camp in the GEM report (1999) established that social drivers could only be sustainably converted into national growth through a supporting ecosystem in which society is encouraged to take some risks, where opportunity is supported, where skills and knowledge are available to convert opportunity into supply, and where there is a market ready to buy and demand is matched to supply, as illustrated in Figure 2 (below).

Figure 2: Entrepreneurship as an ecosystem



Source: Reynolds, P. D., M. Hay, S.M. Camp, *Global Entrepreneurship Monitor, 1999 Executive Report*, p. 10.

Source: GEDI (2016).

Acceptance of risk-taking and confidence is part of a complex socio-cultural relationship (Trompenaars and Hampden-Turner, 1997; Hofstede, 2001), which is largely shaped by state systems (and thus education), family and personal experiences. Having experience of a family business provides an effective and realistic training ground for enterprise. Consequently, the UK government has been working in partnership with schools and businesses to embed the notion of enterprise into primary and secondary education through the Local Enterprise Partnerships (LEPs). In the report on the relevance of enterprise in education, Young (2014)

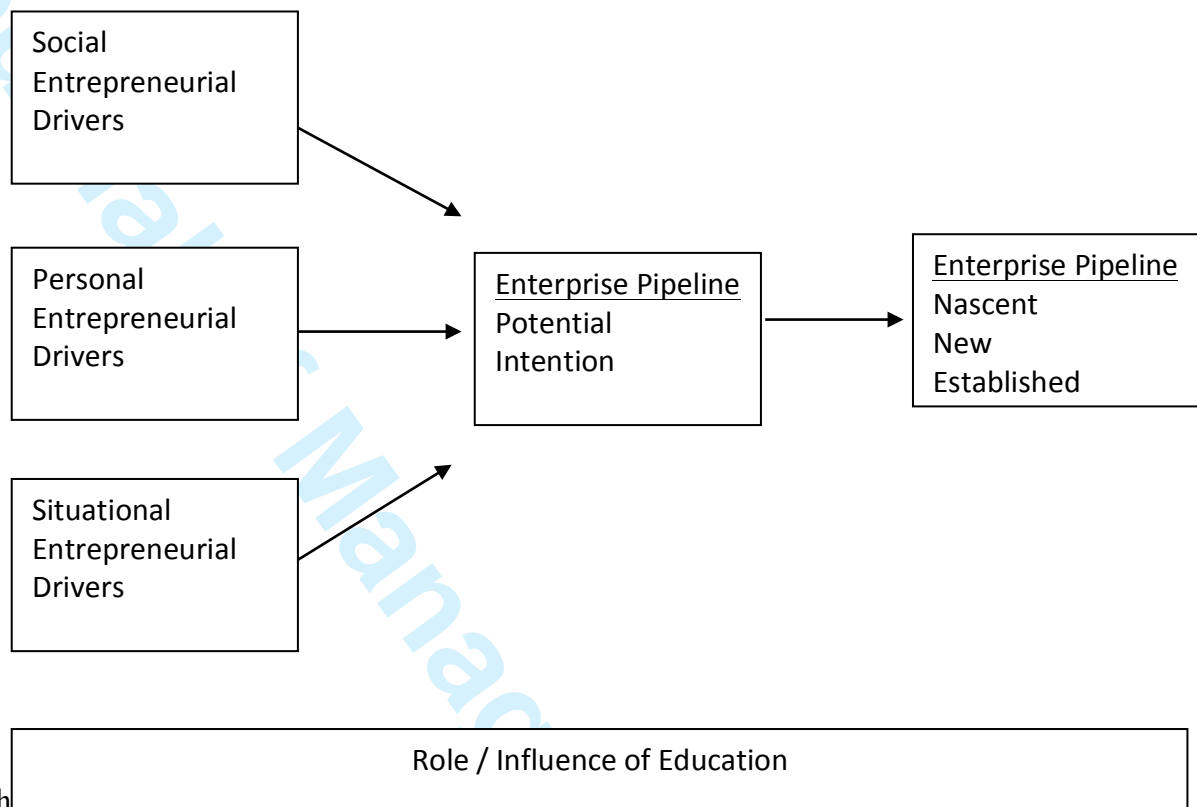
lists a wealth of initiatives and programmes that are engaging young people in business through ‘educational entertainment’. At primary school level the Fiver programme encourages youngsters (under 11 years old) to have fun running a mini-business, and at secondary schools multiple programmes support young enterprise development, including the embedding of enterprise in the curriculum and teacher training in this domain.

Given the ongoing increase in enterprise awareness and training, it is inevitable that universities will need to prepare for a transformed cohort of students with greater potential, innovation and entrepreneurial flair. This new facet may require a different perspective of learning and responses from higher education providers in order to continue the entrepreneurial momentum.

Conceptual model and propositions

The potential for the young (and the less young) to become entrepreneurs is a complex process of socio-economic, socio-cultural, individual and psychological drivers that compete with each other to create a propensity to work for oneself (self-employed) or to work for others (employee) (Wamba and Hikkerova, 2014). Heightened interest in entrepreneurship is being driven by a bottom-up transformation in business models, challenging the long-established approaches of business (Boyer and Blazy, 2014). Social trends in globalisation, global talent migration and the imbalance in employment opportunity, specifically for the young is generating a wave of activity towards business start-ups at all stages of life. For the mature workforce, a business start-up is an attractive alternative to a poor work-life balance, enhancing the skills and training benefits that employment has provided; by contrast, for a young person, enterprise offers a life choice, substantially more beneficial than under-employment or unemployment.

The literature indicates that there are many factors which influence the direction that students will choose, and how successful their enterprise journeys will be. In each case, the enterprise pipeline can be used as a framework to model the options that lead to entrepreneurial intention and thereby business start-up. The key drivers are illustrated in Figure 3 (below). This detail is important as higher education providers contribute to a healthy and wealthy nation – in addition, more talented entrepreneurs tend to be more educated. Currently, out of the 15% of young people who intend to start their own business, around only 5% actually do so. Accordingly, a 1 % increase in those who actually do start their own business would equate to around a further 10,000 new businesses.

Figure 3: Conceptual model to show drivers of the graduate entrepreneurial pipeline

Th to contribute to the effectiveness of the enterprise pipeline, for instance in providing skills and awareness to support enterprise success; to create environments of learning that engender more intention and more start-up activity.

For the purpose of this study, the research specifically intends to explore relationships between social, personal and situational drivers - directly towards entrepreneurial intention, and indirectly towards entrepreneurial start-up. In addition to the relationships between these three 'inputs', the research also considers the subject area of study, and period of progression through the H.E. sector, to address the impact that current higher education philosophy may exert on entrepreneurial intentions. The context of the study is two different yet comparable enterprise pipelines, with different nation education systems, cultures and behaviour – the UK and France.

Methodology

The authors created an online survey instrument with 3 precise criteria; that the survey could be completed in less than two minutes, that it was available in French and English, and that

provided rich data relating to entrepreneurial interests and intentions. The survey was active for three months and was widely promoted in France and the UK. Every effort was made to encourage students from different backgrounds and interests to participate, but inevitably (because of the primary university partnership undertaking this research), the samples were skewed towards engineering students in France and business and technology students in the UK. Nevertheless, the authors believe that the results are still useful and revealing in understanding the current trends in entrepreneurial interest and intentions. The survey was available at www.benefits-project.eu/questionnaire/q_en.php

In total, 18 questions were asked, broken into three sections:

1. Educational
2. Employment
3. Personal information

Where necessary, the questions were slightly adjusted to reflect the nuances of language, systems and cultures specific to each setting but this was 'cosmetic', thereby allowing the results to be aggregated. All of the questions had controlled closed responses to enable qualitative and quantitative statistical analysis to take place. The questions were based on key issues outlined in literature: namely, the themes identified in Kew *et al.* (2014), Young (2014) and RBS (2015) - thereby allowing the testing of hypotheses and making meaningful comments and contributions which can add to a very important policy debate.

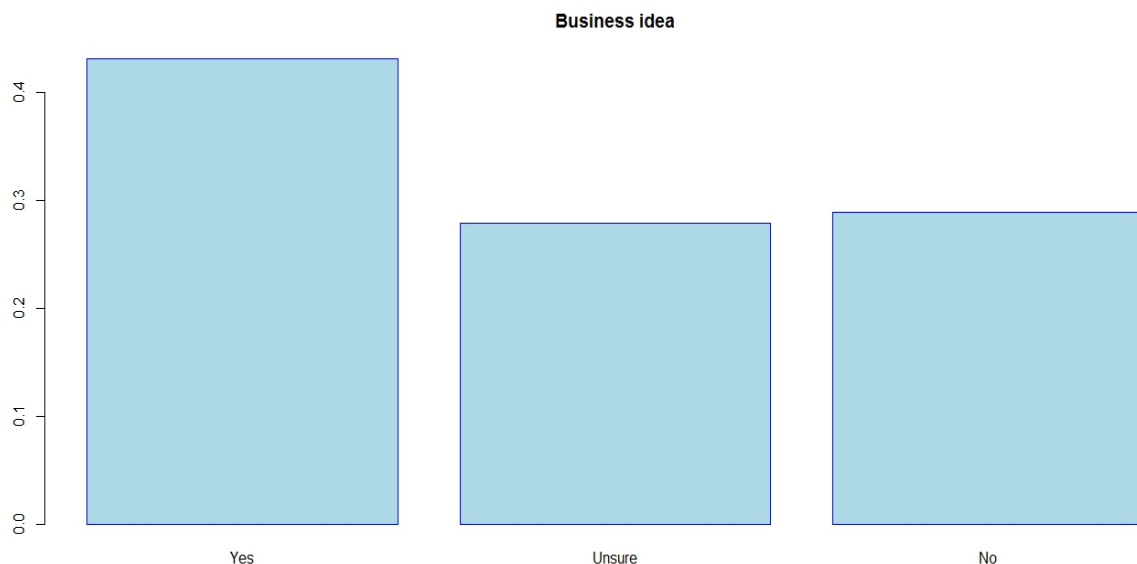
So far, 3448 people started completing the survey instrument (the survey remains live in order to continue gathering data year on year). Many surveys were not fully completed, though the majority of participants completed over 70% of the survey. Unexpectedly, Section 1 was the part that had the most incomplete data. In all, 999 people completed the entire survey. Given the size of the sample, the authors decided to use only these completed surveys for the analysis, although the intention is to take a closer look into the incomplete surveys in the future.

The final question asks for those participants who are interested in the study to provide contact details that can subsequently be followed up. This data will be used to gain further and more detailed insights into the mind-sets and interests of the participants. The results from the survey are useful, interesting and robust, and should add value to future policy, strategy and tactics regarding encouraging entrepreneurship at regional, national and international levels.

Key findings & Discussion

In the UK, there are over 160 higher education institutions within which over a million high ability, high achieving learners with multifarious talents, expertise and interests can be found. In 2014, as part of the European project *Benefits (Building Expert Networks for Innovation Training Systems)* www.benefits-project.eu, a survey was designed and disseminated to test the aspiration and enthusiasm of those studying at higher level, to establish their own business – that is, to become the next generation of entrepreneurs. One question that was asked was: ‘do you have a business idea?’ - to which 43% of respondents answered positively, with a further 28% ‘unsure’, as illustrated in Figure 4 (below).

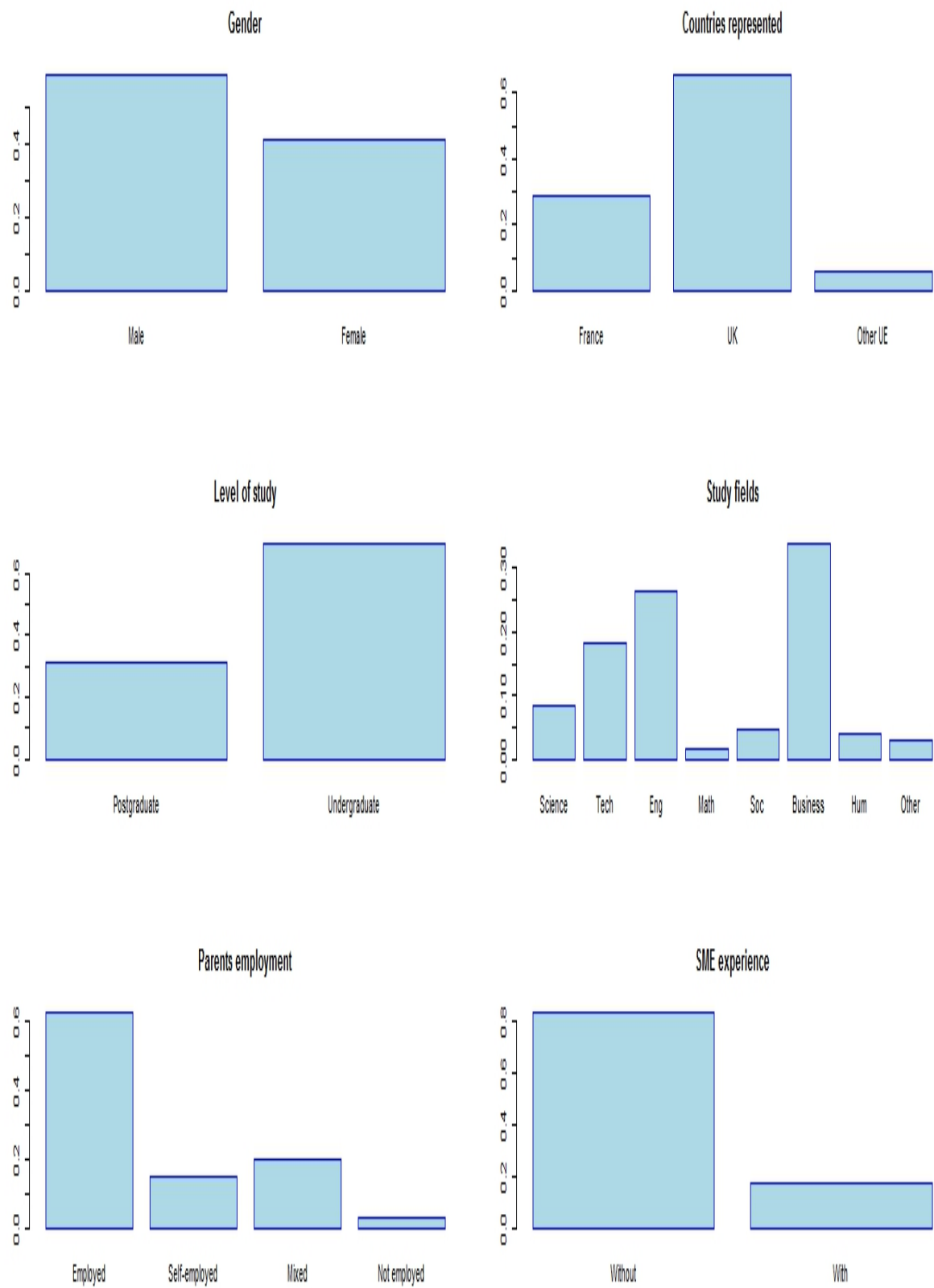
Figure 4: Responses to ‘Do you have a business idea?’



One of the challenges in higher education is to encourage, support and nurture student development. In doing so, the successes could be transformational, and the wider benefits of the process would be profound. There is an urgent need to rethink pedagogical and policy approaches that might be appropriate to consider how and whether higher education should better support business creation as part of the modus operandi.

The results from the question ‘do you have a business idea?’ were crossed with various aspects concerning the participants’ profile: namely gender, study fields (science, technical, engineering, mathematics, social sciences, business, humanities, other), parents’ employment, study level (under or post graduate), year of study (from first to fifth year of higher education), experience of working in an SME and country (France, UK or other EU) – note that Figure 5 (below) represents bar plots of these variables.

Figure 5: Bar plots of participant data



Chi-square (χ^2) testing was then used to test the goodness of fit. The crossed results from survey are presented in the tables 1 to 7, below.

Table 1: Business ideas vs. Gender

	Female	Male
No	129	160
Yes	154	277
Unsure	128	151

Table 2: Business ideas vs. Parents' employment

	Employed	Self-employed	Mixed	Not employed
No	198	33	51	7
Yes	253	81	84	13
Unsure	171	33	64	11

Table 3: Business ideas vs. Study fields

	Science	Tech. ¹	Eng. ²	Math	Social Science	Business	Humanities	Other
No	13	47	94	9	20	76	15	15
Yes	40	90	91	5	14	174	10	7
Unsure	31	42	79	2	13	86	16	8

Table 4: Business ideas vs. Study level

	Undergraduate	Postgraduate
No	194	95
Yes	290	141
Unsure	206	73

Table 5: Business ideas vs. Year of study

	First	Second	Third	Fourth	Fifth	Other
No	53	62	71	43	39	21
Yes	109	94	120	40	40	28

¹Technology

² Engineering

Unsure	68	68	85	31	18	9
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Table 6: Business ideas vs. SME experience

	Without	With
No	268	21
Yes	310	121
Unsure	248	31

Table 7: Business ideas vs. Country

	France	UK	Other EU
No	125	148	16
Yes	86	318	27
Unsure	79	186	14

Thus, using Pearson's Chi-squared test, $\chi^2 = 9.2535$, $df^3 = 2$, $p\text{-value} = 0.009786 (< 1\%)$ it can be confirmed, with a probability of less than 1% of being wrong, that there is a significant link between gender and the participants' aspiration to start a business. Moreover, one can find that there is a significant relationship between the participants' aspiration to start a business and both the study fields ($\chi^2 = 56.047$, $df = 14$, $p\text{-value} = 5.717e-07 (< 1\%)$) and SME experience ($\chi^2 = 61.8014$, $df = 2$, $p\text{-value} = 3.802e-14 (< 1\%)$).

Furthermore, one can deduce (with a probability of less than 5% of being wrong) that their business aspiration is dependent on both parents' employment ($\chi^2 = 14.4624$, $df = 6$, $p\text{-value} = 0.02488 (< 5\%)$) and year of study ($\chi^2 = 23.1964$, $df = 10$, $p\text{-value} = 0.01004 (< 5\%)$).

On the other hand, one can confirm (with a probability of less than 1% of being wrong) that business aspiration and the study level are independent ($\chi^2 = 4.118$, $df = 2$, $p\text{-value} = 0.1276 (> 1\%)$). Finally, one can find that there is a significant relationship between the participants' aspiration to start business and their country ($\chi^2 = 46.5207$, $df = 4$, $p\text{-value} = 1.919e-09 (< 1\%)$). The variables: gender, study fields, parents' employment, year of study, experience of working in an SME and country, are all dependent variables, in other words linked to the ambition and enthusiasm of entrepreneurs.

³ Degrees of freedom

It can be stated, based on the data shown in Tables 1, 2, 3, 6 and 7, and by using the comparison test of two proportions, one can confirm, with a probability of less than 1% of being wrong, that:

- The percentage of female students with a business idea is less than that of male students (p-value = $4.681261e-05$ ($< 1\%$)).
- The percentage of French students with business idea is less than that of British students (p-value = $2.2156e-08$ ($< 1\%$)).
- The percentage of SME experienced students with a business idea is higher than that of students without SME experience (p-value = $7.438494e-15$ ($< 1\%$)).
- The percentage of students with self-employed parents who have a business idea is higher than that of students with employed parents (p-value = 0.0007524836 ($< 1\%$)).
- Finally, it is not possible to confirm that the percentage of students from STEM (Science, Technology, Engineering and Mathematics) fields and who have a business idea is different from that of students from others fields (p-value = 0.1445116 ($> 1\%$)).

Pearson's Chi-squared test shows that, of all the factors explored in the study, only one factor stands out as being independent: **study level** (under or post graduate). Moreover, the comparison test of two proportions confirms that the entrepreneurial potential is more pronounced among British male students, having SME experience, and with self-employed parents. However, concerning these latter results, the authors acknowledge that the diverse participant's profiles (multicultural, multi-ethnic, multithreaded ...) are likely to have some impact. Hence, it would be instructive for future research to explore (with more homogeneous samples) various dimensions and the explanations for these results, namely:

- **Gender:** which gender really "dominates" - and why?
- **Study fields:** students of STEM (science, technology, engineering and mathematics) are generally considered very favourably on the job market – might this explain the motivation of business students to be more entrepreneurial?
- **Parents' employment:** to what extent does the parents' employment influence the career choice of their children, in other words, are entrepreneurial parents a role model?
- **Experience of working in an SME:** does the experience of being in the workplace increase the ambition and enthusiasm to be more entrepreneurial rather than be an employee?
- **Country disparity:** to what extent does business philosophy differ with national context?

- How can it be explained that the variable ‘study level’ (under or post-graduate) is independent regarding entrepreneurial ambition and enthusiasm?

In other words, the authors aim to describe and to explore the target profile of the future student-entrepreneur.

Conclusion

For far too long, students have been educated to be employees, not entrepreneurs. The findings of this study point strongly to the fact that today’s students have a definite willingness or intention to become entrepreneurs. However, the range of pedagogical content (in other words, the courses currently on offer) does not correspond with the ambition of the students who wish to develop entrepreneurial skills.

There is therefore an urgent need for directors of higher education and pedagogues to rethink their education offer in order to create a generation of entrepreneurs for tomorrow’s business world. The challenge will be to integrate two key considerations: how to create a business idea and how to make it happen practically and theoretically. Clearly, change in the education product will necessitate change in the H.E. business model.

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